132. (New) A medical implant having a bearing surface with improved wear resistance, said bearing surface comprising a solid polyethylene which has been previously crosslinked by irradiation and subsequently remelted.

B' cont

133. (New) A method for increasing the wear resistance of a preformed polyethylene comprising the steps of:

(a) crosslinking the polyethylene by irradiating it in a solid state; and

(b) subjecting the crosslinked polyethylene to thermal treatment which is selected from the group consisting of: annealing and remelting.

134. (New) A method for increasing the wear resistance of a preformed polymer, comprising the steps of:

(a) crosslinking the preformed polymer by irradiating it in a solid state;

(b) subjecting the crosslinked preformed polymer to thermal treatment which is selected from the group consisting of: annealing and remelting; and

(c) removing the oxidized surface of the thermally treated crosslinked preformed polymer wherein said polymer is selected from the group consisting of: polyester, poly(methylmethacrylate), nylon, polycarbonates, and polyhydrocarbons.

135. (New) A method for increasing the wear resistance of a preformed polymer, comprising the steps of:

(a) crosslinking the preformed polymer by irradiating it in its solid state; and

(b) remelting the crosslinked polymer, said polymer being selected from the group consisting of: polyester, poly(methylmethacrylate), nylon, polycarbonates, and polyhydrocarbons.

B' cont

136. (New) A performed polyethylene made according to a method comprising the steps of:

(a) crosslinking a starting polyethylene by irradiating it in a solid state to form a crosslinked polyethylene; and

(b) subjecting the crosslinked polyethylene to thermal treatment which is selected from the group consisting of: annealing and remelting;

wherein said preformed polyethylene has improved wear resistance over untreated polyethylene.

137. (New) A preformed polymer made according to a method comprising the steps of:

(a) crosslinking a starting polymer by irradiating it in a solid state to form a crosslinked polymer;

(b) subjecting the crosslinked polymer to thermal treatment selected from the group consisting of: annealing and remelting the crosslinked polymer; and

(c) removing the oxidized surface of the crosslinked polymer.

138. (New) A preformed polymer made according to the method comprising the steps of:

(a) crosslinking a starting polymer by irradiating it in a solid state to form a crosslinked polymer; and

(b) remelting the crosslinked polymer, wherein said polymer is selected from the group consisting of: polyester, poly(methylmethacrylate), nylon, polycarbonates, and polyhydrocarbons.

139. (New) An implantable bearing component made by the process comprising the steps of:

(a) crosslinking a preformed polyethylene in its solid state;

(b) subjecting the crosslinked polyethylene to thermal treatment selected from the group consisting of: annealing and remelting; and

(c) fashioning the implantable bearing component from the crosslinked and thermally treated polyethylene.

140. (New) A product made by the process comprising the steps of:

(a) crosslinking a preformed polymer by irradiating it in a solid state;

(b) subjecting the crosslinked polymer to thermal treatment selected from the group consisting of: annealing and remelting;

(c) removing the oxidized surface of the crosslinked polymer; and

(d) fashioning the product from the crosslinked and thermally treated polymer; wherein said polymer is selected from the group consisting of: polyester, poly(methylmethacrylate), nylon, polycarbonates, and polyhydrocarbons: said crosslink is achieved by irradiation; and said thermal treatment is selected from the group consisting of: annealing and remelting.

B1 cont

141. (Amended) A medical implant having a bearing surface with improved wear resistance, said implant being made according to the process comprising the steps of:

(a) crosslinking a preformed polymer by irradiating it in a solid state;

(b) subjecting the crosslinked polymer to thermal treatment selected from the group consisting of: annealing and remelting;

(c) removing the oxidized surface of the crosslinked polymer; and

(d) fashioning the implant from the crosslinked and thermally treated polymer.

142. (New) A method for determining an optimal radiation dose and thermal treatment for treating a polymer to increase its wear resistance, when made into a desired product, while maintaining its desirable physical and/or chemical properties, the method comprises the steps of:

(a) irradiating the polymer in the solid state over a range of radiation doses likely to

produce the desirable wear resistance and physical and/or chemical properties;

(b) remelting the polymer;

(c) correlating the radiation doses with the wear rate of the desired product made from the irradiated remelted polymer using actual or simulated wear conditions for the desired product;

(d) correlating the radiation doses with each of the physical and/or chemical properties of the desired product made from the irradiated remelted polymer using actual or simulated wear conditions for the desired product;

(e) comparing the correlations in steps (c) and (d) to determine the optimal radiation dose which will produce a desirable wear rate while maintaining the desirable physical and/or chemical properties, if such a radiation dose is arrived at, use this optimal radiation dose for future treatment of the polymer;

(f) if the optimal radiation dose cannot be arrived at in step (e), then determining a dose that would produce a desirable wear rate based on the correlation of step (c) and annealing instead of remelting the polymer which has been irradiated to said dose;

(g) correlating the physical and/or chemical properties of the desired product made from the irradiated and annealed polymer, using actual or simulated wear conditions for the desired product, with different annealing times and temperatures;

(h) determining an annealing temperature and time which will provide the desirable wear rate and physical and/or chemical properties, if this is possible, then use the radiation dose and annealing conditions determined at this step for future treatment of

the polymer;

B' cont

(i) if stop (h) does not provide the desirable wear rate and physical and/or chemical properties, then apply a lower radiation dose and repeat steps (c) to (i) or (h) until the optimal radiation dose and annealing conditions are determined or the steps confirm that no optimal radiation dose and annealing conditions can be obtained for the desired wear rate and physical and/or chemical properties.